# This Week in SP333:6031: Homework, etc.

Problems to submit on the date listed:

Week of 10 Sep

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|---|---|
| Monday : | 2: 9,12, 13 |
| Tuesday: | 2: 15, A6 |
| Thursday: | 2.6 (find the potential function), A7 or A10, A8 |
| Friday: | 1.3 (use $v_o = 14\ ^{m}/_{s}$), 1.8 (use a = v dv/dx), A9 |
| Monday | HOUR EXAM I |

A7. A 100 kg and a 400 kg rock are at rest in deep space separated by 1 km. They fall toward one another until they are 10 meters apart. What is their total kinetic energy ? How is it divided between them ?

A8. Why does Eq 2.95 require that the line integral of $\vec{F}$ around any closed path be zero ?

A9. Consider an oscillator with $\omega_o = 200\ \pi\ ^{rad}/_{s}$, Q = 100, $k = 10^5\ ^{N}/_{m}$. Find the steady state x(t) when it is driven with a force $F(t) = 100\ N \sin[\ 199\ \pi\ ^{rad}/_{s}\ t]$ .

A10. A 1 kg and a 4 kg mass are at rest at the ends a spring with constant $k = 900\ ^{N}/_{m}$ that is stretched 0.20 m beyond its equilibrium length. The masses are released. What will be the total kinetic energy of the masses when the spring is at its relaxed length ? How will the kinetic energy be divided between the two masses. How far will the masses compress the spring before coming to rest instantaneously ?

Consider the question : Does the moon orbit around the earth ? (more in 6 weeks)